

MATH - Algebra 1 Semester 2

Lesson: Monday, April 6th

Learning Target:

Students will factor all types of quadratic expressions.

Bell-Ringer

Review Multiplying Binomials Practice: [Review Activity](#)

Challenges: **Get all practice problems correct and in a row*
***Beat your time with perfect score*

Learning Target:

Students will factor all types of quadratic expressions.

Let's Get Started on the Lesson:

Watch Video → [Factoring: Putting it All Together](#)

Links to Previous Lessons(if you need to Review)

[Lesson 4](#) - Factoring GCF

[Lesson 5](#) - Factoring Trinomials ($a=1$)

[Lesson 6](#) - Factoring Trinomials ($a=1$ with GCF)

[Lesson 7](#) - Factoring Trinomials ($a>1$)

[Lesson 8](#) - Factoring Trinomials ($a>1$ with GCF)

[Lesson 9](#) - Factor by Grouping

[Lesson 10](#) - Factoring Special Case

[Lesson 11](#) - Factoring Special Case

Practice:

Go to this website:

[Factoring Polynomials](#)

1. Review and factor the problem on [Factoring Polynomials](#)
2. Steps to Factoring:
(using the x)
 - 1) Look for a GCF
 - 2) Label/Know values for A, B, and C.
 - 3) Fill out Top (A times C) and Bottom (B)
 - 4) List multiples of AC
 - AC Positive - Add Multiples
 - AC Negative - Subtract Multiples
 - 5) Check Signs (Side Numbers: Multiply to top; Add/Subtract to bottom)
 - 6) Divide the side values by A (reduce if you can)
 - 7) Rewrite as factors
 - Denominator is the leading coefficient in the binomial
 - Numerator is the constant in binomial
3. Make sure to review those steps. This will become very important when we get to solving quadratics in a few lessons.
Using the x in solving will give you a huge shortcut when finding the values of the zeros/x's.

Practice continued

4. Walk through the following problem on your paper to help you review factoring.

$3x^2 - 8x - 16$ *NO GCF

$A=3$ $B=-8$ $C=-16$

$\frac{4}{3} = \frac{4}{3}$ $\frac{-12}{3} = -4$

$(3x+4)(x-4)$

A.C
 ~~-48~~
 4 -12
 ~~8~~

-48 Subtract
 1 48
 2 24
 3 16 $+8$
 4 12
 6 8

Practice continued

5. Walk through the following problem on your paper to help you review factoring.

$12x^2 + 39x + 27$ * Has a GCF ^{terms}
 $3(4x^2 + 13x + 9)$ $\rightarrow 3$ (Divide all by 3)

$A=4$ $B=13$ $C=9$

$\frac{4}{4} = 1$ $\frac{9}{4} = \frac{9}{4}$

Don't forget GCF

$3(x+1)(4x+9)$

AC 36
4 9
B 13

36
1 36
2 18
3 12
4 9
6 6

Add \rightarrow to 13

Practice continued

6. Walk through the following problem on your paper to help you review factoring.

$27x^2 - 12$ * Has a GCF
 $3(9x^2 - 4)$ $\hookrightarrow 3$

$a = 3x$ $b = 2$ \hookrightarrow Special Case: Difference of Squares

$3(3x+2)(3x-2)$

- $a^2 - b^2 = (a+b)(a-b)$
- Square Root of $9x^2 \rightarrow 3x$ (a)
- Square Root of $4 \rightarrow 2$ (b)

Practice continued

7. Walk through the following problem on your paper to help you review factoring.

$25x^2 + 40x + 16$ *No GCF

$a = 5x$ $b = 4$ \hookrightarrow Special Case: $a^2 + 2ab + b^2 = (a+b)^2$

$(5x+4)(5x+4)$

$\hookrightarrow (5x+4)^2$

- Square Root of $25x^2 \rightarrow 5x$ (a)
- Square Root of $16 \rightarrow 4$ (b)

8. The next slide starts the independent practice. Try them on your paper and don't be afraid to make a mistake. If you get totally stuck, then you can go to slide 9 for a hint on the problem. The key to the practice is on slide 10.

Independent Practice

Complete the problems [Hints are on the next slide]

Factor each polynomial.

1. $x^2 - 7x + 8$

2. $2x^2 + 4x - 6$

3. $9x^2 - 25$

4. $x^2 + 20x + 100$

5. $6x^2 - 11x - 2$

6. $6x^2 - 24$

Which of the following are factors of the polynomial: $3x^2 - 13x + 12$?

- A. $(3x + 4)$
- B. $(x - 3)$
- C. $(3x + 12)$
- D. $(x + 12)$
- E. $(3x - 1)$
- F. $(3x - 4)$
- G. $(x - 4)$

Independent Practice Hints

Here are some hints to maybe get you started.

Factor each polynomial.

1. $x^2 - 7x + 8$

Multiples of 8 that subtract to -7.

2. $2x^2 + 4x - 6$

Has a GCF of 2. Divide all coefficients by 2.

3. $9x^2 - 25$

Special Case - Difference of Squares
 $a^2 - b^2 = (a + b)(a - b)$

4. $x^2 + 20x + 100$

Special Case - 100 is a perfect square.

$$a^2 + 2ab + b^2 = (a + b)^2$$

5. $6x^2 - 11x - 2$

Multiples of 12 that subtract to -11.
Using X - need to divide side numbers by 6.

6. $6x^2 - 24$

Has a GCF of 6
AND
Special Case - Difference of Squares
 $a^2 - b^2 = (a + b)(a - b)$

Which of the following are factors of the polynomial: $3x^2 - 13x + 12$?

- A. $(3x + 4)$
- B. $(x - 3)$
- C. $(3x + 12)$
- D. $(x + 12)$
- E. $(3x - 1)$
- F. $(3x - 4)$
- G. $(x - 4)$

Multiples of 36 that subtract to -13.
Using X - need to divide side numbers by 3. There are two to select.

Answer Key

Once you have completed the problems, check your answers here.

Factor each polynomial.

1. $x^2 - 7x + 8$
 $(x - 8)(x + 1)$
or
 $(x + 1)(x - 8)$

4. $x^2 + 20x + 100$
 $(x + 10)(x + 10)$
or
 $(x + 10)^2$

2. $2x^2 + 4x - 6$
 $2(x + 3)(x - 1)$
or
 $2(x - 1)(x + 3)$

5. $6x^2 - 11x - 2$
 $(x + 10)(x + 10)$
or
 $(x + 10)^2$

3. $9x^2 - 25$
 $(3x + 5)(3x - 5)$
or
 $(3x - 5)(3x + 5)$

6. $6x^2 - 24$
 $(x + 10)(x + 10)$
or
 $(x + 10)^2$

Which of the following are factors of the polynomial: $3x^2 - 13x + 12$?

A. $(3x + 4)$

B. $(x - 3)$

C. $(3x + 12)$

D. $(x + 12)$

E. $(3x - 1)$

F. $(3x - 4)$

G. $(x - 4)$

$(x - 3)(3x - 4)$

or

$(3x - 4)(x - 3)$

Additional Practice:

Click on the links below to get additional practice and to check your understanding!

[Practice with Factoring Polynomials](#)

(Play Game or Practice with Flashcards)

[More Practice with Factoring](#)

(Play Game or Practice with Flashcards)